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THE BOAT; AND HOW TO MANAGE IT:

A TREATISE ON

THE MANAGEMENT OF ROWING AND
SAILING BOATS;

WITH RUDDIMENTARY AND FINISHING LESSONS IN ROWING;
AND PRACTICAL INSTRUCTIONS IN SAILING :

*The Laws of Boat-racing, Match-sailing,
&c. &c.*

BY

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P R E F A C E.

STRANGE to say, there are very few books in our Libraries which treat practically on the Rudiments and Principles of Rowing and Sailing, and the General Management of Open Boats. The Author of this little Treatise has, through life, been devotedly fond of Boating; he has sailed many matches, rowed many races, and often been placed in perilous positions, both at sea and on the river; from all of which considerable experience has been gained. He, therefore, offers this little volume to the Public as a Treatise founded entirely on his own practical experiences.

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THE BOAT;

AND HOW TO MANAGE IT.

ROWING-BOATS.

UNDER this head are comprised boats of all denominations, except steam-boats and sailing-boats.

The rowing-boats which first demand our attention are outriggers, scullers, galleys, and waker-boats. These are, probably, the lightest, longest, narrowest, and most scientifically constructed rowing-boats in the world: and when manned by experienced hands, they are propelled at such a rate that no other form of boat can compete with them. They are the pride of the river Thames, and the glory of the two Universities of Oxford and Cambridge.

These are generally made from a solid piece of mahogany, scooped and hollowed out with the most delicate care and skill, until the whole is scarcely thicker than the edge of a half-crown.

B

The outside is shaped after the most approved and studied form, and afterwards smoothed and polished till it is as glib and lubricous as a mirror. The inside is strengthened by transverse ribs of tough wood, judiciously fitted and secured across the floor, and up the sides of the boat. The top of the boat is, with the exception only of the central part, in which the rower sits, entirely covered with a thin scantling ; or, what is more usual, waterproof canvas or oil-skin ; the latter is preferable because of its lightness. Bulk-heads perfectly water-tight divide the fore and aft part from the compartment in which the rower sits : and the last named compartment is further protected from spray and broken water by coamings or wash-boards, about one or two inches in height, which are fitted across the boat at the bulk-head divisions.

So shallow is the form of a wager-boat of this description, that when the rower is seated, the top rim on each side, amidships, is not more than from one to two inches above the water ; but it gradually rises to three or four inches at the bows : at the stern it is nearly level with the surface of the water.

A sculler or wayer-boat; suitable for one person only, is usually about thirty feet in length and not more than sixteen or eighteen inches in width at the broadest part.

Iron outriggers are firmly affixed to the rim and rowlocks on each side the boat; these stand out several inches from the outer sides of the boat; and so enable the rower to use long and powerful sculls, and give a more extended fulcrum for using the oars, whereby immense power is obtained over the boat. His seat is raised to the level or nearly so, of the top rim of the midship section; and thus a greater command is obtained over the oars. There is also a foot-board or stretcher, which, being fitted to a rack, may be shifted so as to suit the position or length of legs of the rower.

The sculls used by the rower in a boat of this kind, should be of such a length that they over-lap each other five or six inches, when in use in the hands of the sculler.

Stepping in and out of these boats requires care; the boat should be held by a waterman whilst the rower gets in, and until he is fairly seated.

Such is the modern form of boat in which

all distinguished rowing-matches now take place.

Four-oared and eight-oared outriggers are built on a precisely similar plan ; but of course considerably longer, and rather wider amidships. None of these boats have keels.

A four-oared outrigger is usually from forty to fifty feet in length.

An eight-oared outrigger is from sixty to seventy feet in length; and from two feet, to two feet four inches in breadth at the widest part.

The cost of one of these beautiful eight-oared boats, finished in the best style, is not less than £60. They are built out of a solid straight tree of the best white pine.

The flatter the floor the more buoyant the boat, and the less likely to roll. A flat floored boat will also go through broken water safer than a sharp or cranky bottomed boat.

Eight-oared outriggers are very difficult to steer, and require good judgment and experience.

The coxswain works the rudder by yoke lines: he should be careful not to use the rudder too sharply, or it will impede the progress of the boat. He had better call to his crew to "ease!" on the bow side or stroke side, according to

the direction in which he wishes to guide the boat.

In matches with four-oared outriggers a coxswain is usually chosen of about seven stone weight. In those with eight-oared, one of nine stone or thereabouts.

ROWING.

RUDIMENTARY LESSONS.

THE young rower should bear in mind that the oar is the lever, the water the fulcrum, the boat the weight to be moved, and the hand the power which puts the lever and weight in motion.

An oar consists of three parts,—the handle, the loom, and the blade. The rower will find that he has better control over the oar if the handle is not quite smooth: it should be merely rasped: and, besides, a smooth handled oar is likely to slip from the hands, or roll round in the fingers, when in active use.

Feathering, is a graceful mode of finishing the stroke when rowing, by turning the blade of

the oar from a perpendicular to a horizontal position, at the moment of taking it out of the water : this occurs at the finish of a stroke. Feathering is best learnt by practice.

The tyro should commence practising the art of rowing in an ordinary skiff ; and he should thoroughly learn to row with a single oar before he ventures on using a pair of sculls.

It is important that his early practice should be in a safe but tolerably light form of boat : certainly not in an outrigger.

The author of "Principles of Rowing" says, "the use of very light boats by young oars is destructive to the acquisition of good style."

As the tyro advances in the art he may change from a skiff to a small gig, and then to a boat of much narrower form. But he should not venture to practise in an outrigger until he is tolerably skilful in the use of a pair of sculls, and steady and confident in his style and mode of rowing.

It is in outriggers where skill, style, and finish is acquired ; but. no promising young rower should too soon be put into a boat of this kind.

Outriggers are easily upset ; the least swerve,

false stroke, unequal pressure or inclination to either side, and the rower is turned into the water.

In smooth water, no other boats can be rowed so swiftly ; and with a skilful and well-trained crew, they are comparatively safe ; but in rough or broken water they are easily filled and upset, and the exertion required to propel them in rough water is considerably greater than in smooth, though they may be pulled completely under broken water ; as was the case in the Oxford and Cambridge boat-race on the Thames in 1859. In this memorable match, which came off on a very rough day, the Cambridge crew rowed until their boat became water-logged and filled beneath them. The gallant crew were then left struggling for their lives in the water. I was present at the race, and saw the mishap ; and I believe that no one who witnessed the scene will ever forget it. A more spirited and determined race was never rowed.

The proper position to sit in an outrigger is with the feet firmly placed against the stretcher exactly in the middle ; the heels close together, the toes a little apart, the knees slightly bent, but not so that the oars touch them in rowing.

The thwart or seat should be properly elevated. If too low, the rower is apt to drive the boat under water. A light smart stroke is the least depressive to the boat ; and such cannot be made unless the rower sits high enough to command complete power over the oars and boat.

In rowing attend particularly to the movements of the body ; swing yourself to and fro at your work in a straight line with the stem and stern of the boat : throwing yourself well forward on taking hold of the water with the oar, and leaning well back on feathering or taking the oar out of the water. Thrust the chest forward, and let the shoulders have full and free play.

“ Catching a crab ” is the term for a blunder made in rowing, when the oar hangs in the water, through the blade turning with the flat side upwards ; and then, if the boat has “ way on,” the rower is thwarted in his action, and he either upsets the boat or topples heels over head backwards.

ROWING.

FINISHING LESSONS.

THE finished style of rowing is that by which the boat is propelled through the water with grace and ease ; and in a straight undeviating course ; the stroke of the oars being in even and accurate time as if regulated by a chronometer, and the blades dipped to the exact depth at every stroke ; the oarsman should lay out his strength with well-timed skill, and give the greatest possible impetus to the boat : and finally, feather the oar at the close of each stroke at the exact time ; carrying the oar back for the next stroke at the proper elevation from the water ; and all with ease, precision, and grace.

The oars should be dipped just far enough to cover the blade : anything beyond the blade is too deep, and tends to unsteady and roll an outrigger. It is better not to dip the oar in the least beyond the blade, rather than to acquire the habit of digging too deeply into the water.

In four and eight-oared outriggers, and wager-boats generally, it is of great importance to keep

exact time in using the oars : they must all be dipped, pulled, and feathered at the same precise time. The crew should lay out their strength simultaneously, as if they were one perfect piece of mechanism, moving the boat at a single stroke.

And bear in mind, that keeping time is not strictly keeping stroke ; because the rower may shirk his work by not exerting himself according to his strength.

Any bad rowing or inequality in pulling, in one of the crew of a wager-boat, will cause the boat to roll or swerve. It is a great acquisition to be able to row without jerking or causing the boat to vibrate. And the rower should be careful not to splash. In rough water, during the excitement of a match, this cannot always be avoided ; but in rough water the oar should be feathered at a rather higher elevation than in smooth.

The *stroke-oar* should always be careful not to overreach his crew : he is, or ought to be, the best man in the boat : all the others look to him as the index to their work.

Row with spirit in a match ; and put forth your strength boldly and fearlessly.

Pull at the water from the moment the blade of the oar is in : and increase your pull so that your greatest strength is put forth at the end of each stroke.

The stroke which gives greatest propulsive force, is of course the most desirable : and in order to acquire it, the strength must be applied in a proper mode and at exact time.

If you row deliberately, you will feather skilfully : but if your stroke be careless or deviating, so will be your feathering.

An awkward or heavy swing of the body will cause the boat to dip or plunge fore and aft.

When rowing a match, look straight aft, and let nothing induce you, during the contest, to turn your head.

Do not move the head to look after your oar, nor lean in the least to one side or the other.

Carefully avoid the defect of making the latter part of your stroke in the air : such is a great fault.

Sit upright, and avoid as much as possible any roundness of the back.

In sculling (*i.e.* rowing with two small oars or sculls) pull both sculls in exact time, and with equal strength : sit square to the boat, and

swing the body in a straight line, as you move to and fro with the oars.

None but practised rowers can safely sit and row, effectively, a first-class sculler's wager-boat.

THE OXFORD AND CAMBRIDGE ROWING-MATCHES.

Of all the rowing-matches in the world, probably none is more popular and attractive than the annual Oxford and Cambridge boat-race, which takes place on the Thames, generally in April or May ; the course being from Putney Bridge to Mortlake.

In these matches two of the most perfect eight-oared outriggers that can be built, are manned by crews selected from the most skilful oarsmen each University is able to produce ; and these struggle for the palm of victory in public contest on the Thames.

The competitors are all gentlemen members of the two Universities ; and be it said to their honour, they row for no prize or stake whatever, but for that which, to men of magnanimous minds, is of far higher value,—the proud distinction of being termed the “first

oarsmen in the land," and the chosen representatives of their University. It is a test which embraces superiority in science, skill, and muscular strength; and the very fact of of being selected as one of the crew of a University eight in these gallant contests, is of itself an honour of no mean distinction; and one which can only be gained from perseverance, hard toil, training, and much self-denial. Among these rival crews are some at least who are destined to figure conspicuously in public life; and many a man who has acquired fame and distinction in after life, has been in his college days, one of the chosen crew of the University eight. It is an indisputable fact, that a course of training to manly exercises, during the days of toil and study at the Universities, is of incalculable advantage, both mentally and bodily; and there is no exercise which tends more towards promoting health and vigour than rowing.

But among those who delight to witness these vigorous, ardent, and determined struggles, how few there are who reflect on the amount of labour and training that is necessary, in order to bring each man to that admirable state of per-

fection in which he appears on entering the lists of the University eights.

TRAINING FOR BOAT-RACING.

(GENTLEMEN AMATEURS.)

It is necessary on commencing a course of training for rowing in a match, to consider the habits of life and mode of living to which the person has been accustomed: it being almost impossible to find a dietary system such as would succeed with every one. Regard must also be had to the condition of the subject. If a person of full habit, with superfluous flesh, a Turkish bath may be taken occasionally in the earliest part of the training; also a mild purgative; but during these proceedings the only exercise allowed should be gentle walking; and that exercise may be gradually increased until the subject is equal to a smart run of fifty or one hundred yards daily, on a level; and eventually up-hill.

The strictest regularity must be observed in taking the meals and nights' rest. Go to bed at ten o'clock, and rise in the morning at six, in the summer season, and not later than seven at

any other season. Take a cold bath the first thing in the morning; and well rub the body and limbs with a rough towel; after which a cup of thin gruel may be taken: then take a walk or a short steady row; after which rest nearly half an hour before taking breakfast. Eat a broiled chop or steak without fat. Sauces and pickles must be shunned: eat stale bread with a very little butter; and drink one breakfast cup of tea. Breakfast punctually at eight o'clock or half-past; and keep to the time throughout your training. Luncheon may be taken at about half-past twelve or one; and should consist of a chop or small steak, or cold meat and stale bread, with a glass of ale or stout.

Between luncheon and dinner you should row your best and longest course, unless the weather is hot or sultry; in which case the evening will be the better time: taking care to wait two or three hours after a hearty meal before rowing or taking strong exercise.

Dine at half-past five or six: eat good wholesome beef or mutton with potatoes, stale bread, and a pint of ale. Once or twice a week boiled or roast fowl may be eaten at dinner, also

brocoli, cabbage, or some other plain vegetable, without sauce or butter. If you have been regularly accustomed to take wine with your dinner, a little may do no harm whilst under training; but bear in mind that it is the solids which strengthen; and that the less liquids you take the better. Judiciously shun puddings, pies, and pastry, also spices and all heating or thirst-creating substances.

Before retiring to bed, from half a pint to a pint of thin gruel, with a slice of dry toast, may be taken.

In all your practice, row with deliberate attention to the best and most effective style; taking long, steady and sweeping strokes; and do not over-exert yourself.

It is always better, if possible, to train the whole crew together; and keep them to steadiness and regularity; taking care that their minds are constantly occupied with out-door amusement or exercise, unless the weather forbids.

TRAINING FOR BOAT RACING.

(WATERMEN ROWERS.)

It is obvious that many of the preceding instructions as to training for "gentlemen amateurs" will scarcely apply to watermen, whose habits, condition, and circumstances are totally different to the others.

It must be remembered that in all cases the constitution of the man under training must be taken into consideration; and such deviations made from the established rules as may, in the discretion of the trainer, be deemed necessary.

When the match is for a heavy stake or valuable prize, it may answer the purpose of watermen to devote themselves entirely to a strict course of training; giving up their daily occupations, and attending exclusively to a preparation for the approaching contest.

If the man is of full habit, it may be advisable to administer a dose or two of purgative medicine: after which any superfluous fat may be got rid of by exercise, long walks, and running: and the man under training should be made to

bathe occasionally, or thoroughly cleanse his skin with soap and water. Cold-water bathing every morning will, in most cases, be found very beneficial.

It is not always advisable that rowing should take place before breakfast, unless the training is during sultry weather : sometimes half an hour's walk, or exercise with dumb bells, or some such practice, is to be preferred. Before taking the early walk or exercise, the man under training should, immediately on leaving his bed-room, take a hard biscuit and glass of water, or cup of tea.

He should breakfast at eight o'clock, taking the same diet as that recommended in the preceding chapter for gentlemen amateurs.

For luncheon, at about eleven o'clock, he may take a glass of ale or stout and a crust of bread : but it is better to dispense with luncheon altogether if he can.

For dinner, at about one or two o'clock, give a good slice of beef or mutton, the best that can be had ; but with little or no fat : vegetables may be eaten in moderation : the allowance of beer at dinner should be from half a pint to a

pint, according to the exercise the man has taken since breakfast ; and according to what he has taken at lunch.

With some men, however, this diet and mode of living would be so totally different to what they have been accustomed to all their lives, that it would be unwise to adhere too firmly to the rules here laid down : but rather, in some cases, to allow the men a change, to any good, plain, wholesome, and substantial diet they prefer.

No rowing or strong exercise should be taken until an hour or two after dinner : and in hot weather the hardest and longest exercise at the oars should be taken in the cool of the evening.

Tea may be taken at about half-past five ; to consist merely of a cup of tea and stale bread and butter. At about eight o'clock a light supper, consisting of a glass of good ale and a crust of bread, may be taken : but a day or two previous to the race, suppers should be altogether abolished.

Go to bed at ten o'clock ; having first taken a walk or stroll for half an hour or so.

During the process of training, the man should row frequently, but not so as to over-

exert or fatigue himself: and on returning home after strong exercise, a change of linen, and a rub down are highly essential.

In all your practice row in your best style ; never carelessly, but always with a desire and determination to improvement and excellence.

Rowing Matches.

LAWS OF BOAT RACING,

AS ADOPTED BY THE UNIVERSITIES OF OXFORD AND
CAMBRIDGE.

1. All boat races shall be started in the following manner:—The starter on being satisfied that the competitors are ready, shall give the signal to start.

2. If the starter considers the start false, he shall at once recall the boats to their stations; and any boat refusing to start again shall be distanced.

3. No fouling whatever shall be allowed.

4. It is the province of the umpire, when appealed to, but not before, to decide a foul; and the boat decided by him to have fouled, shall be distanced.

5. In case of a foul the umpire, if appealed to during the race, shall direct the non-fouling boat to row on, which shall, in every case,

row over the remainder of the course in order to claim the race.

6. It shall be considered a foul when, after the race has commenced, any competitor, by his oar, boat, or person, comes in contact with the oar, boat, or person of another competitor ; and nothing else shall be considered a foul.

7. Any competitor who comes into contact with another competitor, as defined in Rule 6, by crossing into his competitor's water, commits a foul : but when a boat has once fairly taken another boat's water by a clear lead, it has a right to keep the water so taken.

8. A boat shall be held to have a clear lead of another boat when its stern is clearly past the stern of that other boat.

9. It shall be held that a boat's own water is the straight or true course from the station assigned to it at starting ; but if two boats are racing, and one fairly takes the other's water by a clear lead, it shall be entitled to keep the water so taken to the end of the course ; and if the two boats afterwards come into contact while the leading boat remains in the water so taken, the boat whose water has been so taken shall be deemed to have

committed a foul; but if they come into contact by the leading boat's departing from the water so taken, the leading boat shall be deemed to have committed a foul.

10. The umpire shall be sole judge of a boat's straight or true course during every part of the race.

11. If any race, in which more than two boats start, a foul takes place, and the boat adjudged by the umpire to have been fouled reaches the winning post first, the race shall be decided as the boats come in; but if the boat fouled does not come in first, or if the umpire is unable to decide which boat has committed the foul, the race shall be rowed over again, unless the umpire shall decide that the boat which came in first had a sufficient lead at the moment of the foul to warrant its having the race assigned to it.

12. Whenever the umpire shall direct a race to be rowed over again, any boat refusing so to row again shall be distanced.

13. Every boat shall stand by its accidents.

Rowing Matches.

LAWS OF BOAT RACING,

AS ADOPTED BY THE COMMITTEE OF THE ROYAL THAMES
NATIONAL REGATTA.

1. All races shall be started in the following manner :—The starter shall ask the question, “Are you ready?” and upon not receiving a reply in the negative, shall give the signal to start.

2. While waiting the signal to start, all boats shall lie at the post, with the oars or sculls feathered at right angles with the keel, and not with the handles reached out over the stretchers.

3. If the umpire considers the start unfair, he shall at once recall the boats to their stations.

4. No race shall be awarded to any competitor or crew unless they shall have rowed over the whole of the course.

5. No fouling whatever shall be allowed.

6. The umpire when appealed to, and not before, shall decide all questions as to a foul.

7. A claim of foul (which must be tendered by the competitor himself, and not by any one on his behalf) must be made to the umpire previously to the man fouled getting out of his boat, unless prevented by accident.

8. A foul shall be deemed to have occurred when, after the race has commenced, any competitor shall by his oar, boat, or person come into contact with the oar, boat, or person of another competitor; and nothing else shall be considered a foul.

9. Any competitor who comes into contact with another competitor, as defined in Rule 8, by crossing into his opponent's water before having a clear lead, commits a foul; but when a boat has once fairly taken another boat's water by a clear lead, it has a right to keep the course so taken.

10. A boat shall be held to have a clear lead of another boat when its stern is clearly in advance of the stern of such boat.

11. A boat's own water is the straight or

proper course from the station assigned to it at starting ; but if, in a race, one of two boats fairly takes the water of the other by a clear lead, and they afterwards come into contact, while the leading boat remains in the water so taken, the boat whose water has been so taken, shall be deemed to have committed a foul ; but if they come into contact by the leading boat's departing from its proper course, the leading boat shall be deemed to have committed a foul.

12. The umpire shall be sole judge of a boat's straight or proper course.

13. If any race, where more than two boats start, a foul takes place, and the boat fouled does not come in first, or if the umpire is unable to decide which boat has committed the foul, the race shall be rowed over again, unless the umpire shall decide that the boat which came in first had a sufficient lead at the time of the foul to warrant its having the race assigned to it.

14. If a foul shall have been allowed by the umpire, in any race, where more than two boats are contending, and the boat committing

the foul comes in a-head of the boat fouled, the boat fouling shall be placed next to the boat fouled.

15. Every boat shall stand by its accidents occurring during the race.

16. No boat shall be allowed to accompany a competitor for the purpose of directing his course, or affording him other assistance; and the umpire shall be at liberty to declare any competitor distanced who may have derived an unfair advantage thereby.

17. The decision of the umpire shall in all cases be final: and any competitor refusing to abide thereby shall be distanced.

Sailing Boats.

THE form and rig of sailing boats varies considerably, according to the nature of the waters and coast about which they are employed.

Thus, on a bold or dangerous coast, a form of boat specially constructed and rigged for sea-going purposes is required; those generally used on smooth rivers and inland waters would be totally unsuited for the sea coast. And so we find at different ports around our coast there are different kinds of boats: one peculiarity of form and rig being generally prevalent, and considered by the local boatmen as superior to all others in the world.

At almost every favourite watering-place there is a favourite form of boat and rig, which is adopted from generation to generation by all succeeding boatmen. Take for instance the Yarmouth yawls: these are, truly, splendid boats, equal in many respects at sea to life-boats, and of surpassing speed: they are long, low, sharp, and shallow; but particularly grace-

ful and elegant in appearance. They will be described presently, in these pages.

The best form of boat for sailing to windward and general purposes, as a fast and safe pleasure boat, is that with a long sharp bow, and a well proportioned breadth of beam; the breadth to be continued or carried well aft; and if the boat is nearly as wide under the quarter as amidships, so much the better, both for safety and power. Boats with narrow or tapering sterns are not to be desired for sailing. A boat with a flat floor and good aft-beam is enabled to carry sail with far greater safety than one with a wedge-like floor and narrow beam.

The inexperienced are particularly cautioned against the danger attending the sailing of boats of a narrow or cranky form of hull.

Boats of such a form may be well adapted for rowing, but are at all times unsafe for sailing.

Short "beamy" boats are by far the safer, swifter, and better form for small sailing craft; and by far the better adapted for turning to windward in narrow channels.

Long-boats are best adapted for reaching and sailing in wide waters where little tacking is required; also for sailing on a bowline and running before the wind.

Boats intended for sea-going purposes should have high bows, like the North Country coble, Yarmouth yawl, and others; and the ballast should be trimmed rather further aft than in river or smooth-water boats: at the same time no ballast should be placed in the extremity of the stern: both ends of sea-going boats should be kept as light and buoyant as possible.

HALF-DECKED BOATS.

THESE are sailing boats with a narrow deck or water-way within the gunwales, and all round the interior. The object of the half-deck being to render them safer when listing over under pressure of sail; so that, although the gunwales be occasionally dipped under, the water cannot get into the boat, because of the half-deck.

The half-deck is considered a great means of security to an open sailing boat. It also makes the boat more complete, and enables the young sailer to carry more canvas.

Inexperienced persons should be careful not to rely on the security of a sailing boat, for the reason only that it has a half-deck or water-ridge, the other part being entirely open, the boat is nevertheless liable to danger on a

pressure of sail, in a heavy sea, or squall, particularly if not a stout beamy little craft.

BALLASTING SAILING BOATS.

THERE are numerous modes of ballasting sailing boats: most of which have some peculiar advantages attached to them which will be briefly referred to. But whatever kind of ballast is used, it should be firmly placed and carefully secured, so as to avoid the great risk which is incurred by the ballast suddenly shifting or breaking loose; as it is very liable to do when the boat lurches, lists, or pitches in a seaway.

In a boat used exclusively for sailing, it is highly desirable to have a complete floor, fitting close down upon the ballast, and well secured by means of small nails.

Lead is probably the best ballast for sailing boats, but the most expensive. To ballast some yachts entirely with lead, the cost of the metal would be found to exceed the cost of the yacht.

Among the many and great advantages of lead ballast are these: it may be stowed away in so small a compass as to interfere but very little with the internal room of the boat. It

renders the boat stiffer under sail than any other kind of ballast, by reason of its dead weight, and the ready manner with which it may be cast to fit between the timbers of the boat.

It does not discolour, rust, or tarnish the paint; and is, therefore, the cleanest ballast that can be used.

It will always realise its intrinsic worth as a valuable metal: in whatever shapes or sizes it may be, there is no deterioration in value.

Next to lead there is no better ballast than iron for sailing boats: but for boats which are used both for rowing and sailing, bags of shingle are frequently used.

No boat can be sailed with safety unless judiciously ballasted. A boat without ballast is unsafe and unmanageable.

Iron keels are not desirable for small boats. It may be true that an iron keel is a very convenient mode of ballasting a sailing boat: and admits of more space for interior accommodation. And some boats sail better with an iron keel than with any other kind of ballast; whilst to others the iron keel cripples them and impedes their progress. Iron keels generally strain small boats, and are otherwise injurious; being constantly under water, they

become rusty and corrosive : the iron fastenings rust and decay, and in a few years the boat becomes leaky.

The advantages gained by the iron keel are, therefore, not commensurate with the disadvantages.

Iron kelsons are somewhat less objectionable ; but even these are not equal to sound English oak, which will last as long as three iron ones. For keels and kelsons of sailing boats there is nothing so durable as English oak.

BOAT SAILING.

THOUGH a very delightful recreation in summer, open boat sailing is always attended with danger when the boat is manned by inexperienced hands : but when the boat is properly fitted, and under the management of those experienced in the art, it is as safe an amusement as riding or driving on the public highway.

Boat sailing is an art which cannot be learnt in a few short lessons : time, attention, and long and frequent practice alone can make a man a good boat sailer.

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The *main-sheet* is so often mistaken by the inexperienced for the *main-sail* that it may be worth while to give as clear an explanation as possible as to these. The "*main-sheet*" is merely the name of a rope by which the *main-sail* is controlled after it is hoisted up and set ; it is that rope which is made fast at the outer end of the sail, or of the boom, and by which the sail may be hauled inboard, so as to set it flat ; or by easing off the *main-sheet* the sail is set free, or allowed to stand away from the aft part of the boat, as when sailing with a fair or free wind.

The *fore-sheet* is the rope by which the *fore-sail* is controlled after it is run up and fairly set. It is made fast to the aft clew of the sail ; and according as it is hauled taut or eased off, so the sail is managed.

We borrow the following extract, as containing some very excellent advice as to boat sailing, and the causes of boats capsising, from "*The Sailing Boat.*"

" Every person who ventures on the water in an open sailing boat, should be given strictly to understand that the most important rope, and that on which the safety of the boat and that of

her crew depends, is the *main-sheet*, next in importance to which is the *fore-sheets*, and if the boat carries two head sails the *jib-sheets*. Every rope belonging to the working of the sails should be laid in a separate coil, so as to be ready to work without obstruction in case of sudden emergency; but especially the *main-sheet*, which should never be made fast, except in the most slight and simple manner; care should be taken that it be not entangled, or in any way hidden from view, whether sailing before the wind, on a wind, reaching, or otherwise: in nine cases out of ten, when boats are capsised, the reason is that the person attending the *main-sheet* in confusion and fright at the moment of danger, or from previous inattention or some other unpardonable cause, fails to slack the *main-sheet* until too late, and at a period when his own weight, and probably that of the other inmates of the boat, suddenly jerked over to the leeward side, actually accelerates the upsetting, and finally precludes the possibility of allowing the boat a chance of righting. It sometimes occurs that the coil or fall of the *main-sheet* becomes entangled or twisted round something in the boat, so as to render it impossible to let go

suddenly. There are some, perhaps, who may consider the latter case as very unlikely to occur ; but there are others who know it has, unfortunately, happened too many times to need any comment to prove the liability and danger."

Large fore-sails in small open or half-decked boats are attended with danger, and are as frequently the cause of accidents as the main-sail.

A sailing boat must always be rigged and trimmed so as to carry an easy weather helm, which she cannot do if the fore-sail is too large. By an easy weather helm is meant, easy steerage and perfect command, so that on the helm being put down the boat instantly turns to the wind. Too large a fore-sail will prevent the boat so turning, and thence the danger.

It is a very important point that the mast of a sailing boat should be no larger or heavier than necessary, but in fair proportion with the size and burthen of the boat ; or so that the canvas would carry it away rather than capsise the boat. If attentive consideration were always paid to this important principle in boat sailing, accidents would be far less frequent.

The mast had better be too slender rather

than too stout. It is not the slender or flexible mast which upsets the boat, but the stout unyielding one.

The principle may be tested in this way—If a boat is overcrowded with canvas in a breeze, of course something must give way, or the boat will be upset: but by letting the main-sheet go, or by easing it off, an accident may generally be prevented: still nothing tends to increase the danger and cause the upsetting of the boat so much as a heavy cumbersome mast. And if the mast is too small, and gives way in a squall, the very fact of its being carried away prevents a more serious disaster. It is seldom that much damage is done by a boat's mast going over her side: and a good spar will bend considerably before it breaks.

There is one very important feature in boat sailing which must be especially attended to, and in which many boat sailers err; I allude to that of putting the helm over too sharply when wishing to come about quickly. Now it should be impressed on the mind of the tyro, that it is not the quickness or suddenness in moving the helm over which brings the boat round; by applying too much or too sudden a force, the boat is

hindered rather than assisted in coming about. The movement should be gradual, firm, and steady, by which means the boat will come about quicker and more certainly; shooting ahead all the while and losing no way. Whereas by the quick and sudden movement, the power of shooting far ahead is lost, and very frequently the boat misses stays, and so loses way considerably.

Another erroneous practice is that of putting the helm up again too soon after the boat has come about ; and by which proceeding she loses way, or lays like a log upon the water, head to wind, until the fore-sail can be hauled a-weather, and her head payed off, or the main-sheet eased off, so as to permit her head to sheer off and the head sails to fill.

After the boat has fairly come about, and the head sails are filled, the helm may be put up. In sailing matches, the greatest nicety is observed in all these apparently trifling minutiae ; indeed the slightest mistake may throw the boat's head off the wind, or bring it up into a dead luff, stopping her way a minute or more, and so losing a well-contested race.

Iron blocks, with brass or soft metal sheaves,

are generally preferred for the upper ropes of a boat's mast, because they are so very much smaller and neater-looking. When wooden blocks are used, those should be chosen which have metal sheaves. Wooden sheaves are sometimes dangerous, they absorb wet, swell, and become set fast in the shell of the block, and so prevent the rope from working freely.

In boats fitted with a lug-sail, it is not unusual for the halliards to be rove through a hole at the top of the mast; or through a hole in which a half sheave is fixed: neither of these plans can be recommended; for if the halliards become stiff or wet, they are liable to get jammed and set fast. The safer plans are to have the mast fitted with a whole sheave, or the halliards rove through a block.

In sailing boats it is a very necessary precaution that all the tackle and ropes connected with the working of the sails should be rove through well-made blocks, or work upon easy-turning sheaves. A fixed sheave or a jammed rope may be the means of preventing your getting a sail down quickly; and so your boat may be capsised; or, on the other hand, they may prevent your getting a sail up quickly,

and your boat being then unmanageable, you may run foul of some obstruction, and do considerable damage. Attention should therefore be paid to the blocks, sheaves, ropes, tackle, and purchases, in order to make sure of their running freely when required to be worked.

Small open sailing boats, not exceeding 15 feet in length, require no shrouds or stays to the mast; the boat is safer without them, and when rather larger, a single shroud on each side the mast is all that is required. It is a great mistake to confine the mast too much: unless it has more or less room for play, the boat will not be near so lively under sail.

It is neither usual nor necessary for the sails of a skiff or small open sailing boat to be fitted with a boom, unless the boat has extra breadth of beam; in which case, the aft or outer tack of the main-sail projects over the stern, and the sail could not then be set flat, nor the main-sheet properly hauled in, unless a boom were used, extending over the stern. Whenever a boom is necessary, it should be fitted with a goose-neck, in order that the sail may be brailed up when necessary, without obstruction by the boom; which,

through the aid of the goose-neck joint, can be drawn up close to the mast, on pulling the fall of the brails.

Empty breakers, or small casks, if well bunged and perfectly air-tight, are excellent safety vales in small open boats. Three or four of such breakers, if lashed under the thwarts, will prevent the boat from sinking even if it becomes filled with water: though probably heavily ballasted boats could scarcely be so upheld, unless the empty breakers were large or numerous.

SETTING SAIL.

ON setting sail, the first thing to be done is, to hook on the bobstay, and bowse down the outer end of the bowsprit; then cast off the lashings by which the main-sail has been furled; see that the main-sheet is clear, and that the fore-sail and jib are ready to be hoisted quickly. Set the main-sail before you set the head-sails, haul the jib out on the bowsprit; but do not hoist until the main-sail is set and the moorings let slip. The main-sail should be fairly set before the boat is slipped from

the moorings, or the anchor weighed. The moment the boat is free, the fore-sail should be run up ; and by hauling the fore-sheet a-weather, the boat's head may be canted as you desire : when fairly under way, the jib should be run up, taking care that the jib-sheets are clear and properly trimmed.

The peak of the sail should not be hauled quite up, until the main is fairly up.

On setting sail amidst crowded shipping, and where there is little room for turning, it will sometimes be found necessary to drop or lower the peak, and set both the head-sails ; when, by hauling the fore-sheet a-weather, the boat is turned in a much more confined space than it could be if the peak were up.

REEFING THE SAILS.

THIS is a performance which requires to be done cautiously, though expeditiously : the boat should be laid-to, that is, luffed close to the wind, but not so as to allow of her coming about, the jib-sheet should be eased off, and the fore-sail hauled a-weather ; then haul in the main-sheet as taut as you can, and the

boat will be "laid-to." The peak and main should then be dropped sufficiently for the proposed reef. You can then cast off the main-tack and haul down a reef; securing it by the reef earings to the boom: then tie up, with reef-knots, all the points along the lower part of the sail; set up the peak and main; ease off the sheets, and haul down the main-tack, and the boat is then under a reefed main-sail. A second and third reef may be taken in the same manner. Never tie up a second or third reef until the first has been fairly secured. And always look to your reef-tackle, and see that all is sound and secure: reefing is seldom rendered necessary except in strong winds and heavy seas.

FURLING THE SAILS.

THE manner in which a cutter's or sloop's sails are properly furled is as follows:—Lift the flap of the sail over the boom; then place the aft leech of the sail over the flap, hauling it taut whilst your boatman neatly rolls the loose sail, and lashes it under the gaff. The sail should never be rolled *round* the gaff or the boom. In sultry weather and also when the sails are

wet or damp, they should be furled very loosely, so that the wind may blow into, and dry them. If closely or tightly furled on such occasions, they will quickly become mildewed.

The fore-sail is generally affixed to the fore-stay ; in which case it should, for the purposes of furling, be lowered to the stem of the boat, rolled up, and coated with an oilskin made for the purpose.

In small boats the fore-sail may be rolled up in the main-sail. Jibs and gaff-topsails are generally kept in the sail-room or cabin : they are never furled or stowed outside the deck.

The sprit-sail and fore-sail are generally stowed or furled without being lowered. After the spreet is taken out, they may be neatly and closely rolled up, and lashed to the mast : but the sails should never be rolled round the mast.

New sails should be well and frequently wetted with salt-water, if you wish to keep them white and free from mildew.

Whenever sails are neglected or allowed to remain furled a long time, without exposure to wind, sun, or dry air, they are liable to mildew, though under a water-proof coating.

After every rain or wetting of fresh water,

the sails should be soaked with salt water : at least such is the way to keep them snowy white and free from mildew.

BOAT IN STAYS.

THE boat is said to be in stays at the time she is coming about, after the helm is put down, and whilst the sails are shaking in the wind. In squally weather it is a critical moment ; for the boat having no way on her, a sudden heavy pressure of wind on the sails is likely to upset the boat, unless the helmsman is cautious, and keeps the main-sheet free.

MISSING STAYS.

THIS implies a refusal on the part of the boat to come about, when the helm is put down. It seldom occurs in smooth water when the boat is properly ballasted and in good trim ; but in heavy seas and rough water, it is no uncommon occurrence.

Whenever a boat misses stays, and there is much wind, there is danger. It is always advisable to avoid putting the boat about in

a squall ; as it is also in rough water, unless she is under perfect control, and faithful in obeying her helm.

SAILING TO WINDWARD.

THIS is the perfection of the art of boat sailing, and though easily learnt it requires skill and practice to perform it successfully. The author of " The Sailing Boat " says—" The art of sailing the boat against wind by sundry zigzag performances requires the nicest skill, a keen watchful eye, and frequent practice to perform in a proper manner."

The boat that will sail fastest to windward must be the best boat in all matches, and invariably the winner of the race cup.

Very much, however, of the success is often to be attributed to a careful attention to the exact trim of the sheets and adjustment of the sails ; the sails should be set as flat as possible for sailing to windward ; but they may be eased off for running free and sailing on a bowline.

In sailing to windward the helmsman must keep a constant eye to the fore-leech or luff of

the main-sail ; and he should steer the boat as close to the wind as he can, without causing the fore-leech to quiver. In other words, he must keep the sails full, though the boat be as close to the wind as possible, without shaking either of the sails.

In smooth water the boat may be sailed much closer to the wind than it can be in rough water. And in squalls and heavy puffs you may sometimes sail in the very eye of the wind : and such is the safest mode of sailing a boat with large sails, when under an extra or dangerous pressure of wind.

It is a maxim among sailors of all classes, to “ keep her full ;” that is to keep the sails full of wind.

When you have to beat up or work to windward in a very narrow channel, it is better to dispense with the jib, and sail the boat under main-sail and fore-sail. It is the pressure and drawing power of the jib which shoots boats a-head so far that, before they can be turned round, the helmsman finds the fore-part of the boat a-ground. Jibs are highly serviceable sails for sailing on a reach or a bowline ; and small working jibs are carried at all times on

some boats : nevertheless large jibs generally do more harm than good on small boats when sailing to windward ; particularly when the channel is so narrow that much tacking is necessary.

SAILING ON A BOWLINE.

THIS is also termed reaching and sailing with the wind free, or blowing sideways, so that you need not keep the sails close-hauled, but rather with the sheets eased off a little, in such a manner that the sails draw very powerfully, and the greatest speed of the boat is thus obtained. The author of the "Sailing Boat" says—

"When sailing on a bowline, trim the main-sheet and jib-sheet to a nicety ; not so that they stand too slack, or cause any part of the sails to flap or quiver ; but so that every inch of sail is felt by the boat, which will be very lively if there is much wind, and she possesses good sailing qualities." Boats of a long narrow form are fastest for reaching and sailing on a bowline.

SCUDDING.

SCUDDING or running before the wind is a part of the art of boat sailing which requires skill and caution: in absence of these there is very great danger; for although the boat when scudding runs on an even keel, or rather is nearly upright, still in the event of the main-sail suddenly or unexpectedly gybing there is the greatest possible danger of the boat being upset.

In squally weather scudding a boat under large sails is a truly perilous performance. Masts are sometimes carried away when scudding with a boat in which there is no backstay to protect the spar.

The safety of the boat and crew when scudding depends on the watchfulness and skill of the helmsman; who, if he sees the slightest indication of the sail gybing, should instantly put down the helm; and so, on a heavy squall, striking the sails.

The fore-sail is of little or no assistance to the boat when scudding: but the jib sometimes

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draws and assists: the jib-sheets should be eased off and trimmed judiciously.

When scudding in very squally weather, or during a fresh or very strong breeze, it is sometimes prudent to drop the peak: and it is quite usual to trice up the main-tack more or less according to the strength of the wind. The safest precaution of all is to reef the main-sail.

THE SAILING SKIFF.

THE safest and most convenient rig for a small open boat is the "sprit-sail and fore-sail."

The usual size of a sailing skiff is about fifteen feet in length, by five feet six inches in breadth of beam. A boat of this description should be fitted with an iron bumkin projecting about one foot beyond the stem. The mast required for the sprit-sail will be only a short and slender one, as there is not much strain upon it; the spreet bears the greater pressure. In shape, the sprit-sail is similar to a cutter's main-sail; but instead of being spread with a gaff and boom, it is simply set with a long spar called a spreet; the lower end of which is fixed

in a selvagee strop, or a grommet and snorter : and the upper end of the spreet is stuck in the eye of the peak of the sail ; and so it is spread. The sprit-sail is a rig by which a boat is enabled to set a very flat surface of canvas ; and to sail very close to the wind. The sails are easily worked, and the boat may be turned up in a tideway against a foul wind with pleasure and satisfaction. Sprit-sails must always be fitted with brails ; and the fall of the brail-rope should always hang in readiness alongside the mast, so that in case of danger or necessity, the sail may be brailed up instantly.

Be careful never to set the spreet inside the brails. It is not a safe plan to brail the spreet up with the sail close to the mast. Indeed many accidents have occurred through so foolish an error. The spreet should always be set outside the brails : the sail may then be brailed up independently of the spreet, and with much greater ease and expedition.

The sprit-sail should be made in such a manner that it may be close-reefed without changing the spreet or even unshipping it. In spreading and setting sail, do so before slipping the moorings or taking up the anchor, taking care that

the sheets are not made fast, and that the boat lies head to wind: indeed, it is difficult and dangerous to attempt setting the sprit-sail with a fresh breeze abaft: the boat must lay with *head to wind* in order to set the spreet up: the same on lowering the sail and unshipping the spreet.

The proper dimensions for a suit of sails for a skiff of five feet six inches beam, by fifteen feet in length, are as under:—

Hoist of main-sail	7 feet 6 inches.
Head	8 „ 3 „
Aft leech	12 „ 0 „
Flap or foot	9 „ 0 „
Length of spreet	16 „ 0 „
Fore-sail luff	10 „ 6 „
Fore-sail aft leech	7 „ 10 „
Fore-sail foot	5 „ 9 „

These dimensions are borrowed (with the consent of the author) from “The Sailing Boat,” and may therefore be relied on as correct.

YARMOUTH YAWLS.

A VERY truthful and interesting description (with a beautiful engraving) of a Yarmouth yawl may be seen in "The Sailing Boat." The author of that work speaks of Yarmouth yawls as "the longest and swiftest yawls, and the finest open boats in the world." Some of them are from sixty to seventy-feet in length, and from ten to twelve feet in breadth: they have exceedingly sharp and graceful bows; are rigged with three masts (either of which may be instantly lowered) and three lug-sails: the largest—or main-sail—being placed amid-ships; the next size forward, and called the fore-sail; and the smallest aft, called the mizzen. When the wind and sea are very heavy, the sails are all close-reefed: and in a gale it is usual to set the fore-sail and mizzen only; the main-mast being unshipped, and lashed, and laid along the thwarts of the boat. Under the two sails the boat is enabled, when well-manned, to live in almost any gale at sea.

The Yarmouth yawls are ballasted with

bags of shingle ; so that when it becomes necessary to lighten the boat at sea, they have only to open a few of the bags and shoot the shingle overboard. There is generally a numerous crew to each of these boats : and when exposed to danger, all except those who have the actual management to perform, squat down on the floor, so as to assist in preserving stability. But, notwithstanding these precautions, the crew is sometimes exposed to great peril ; and it is no uncommon circumstance, when the sea runs high, for it to break over the bows of the yawl : in which case, two or three of the crew are kept constantly employed in scooping out the water.

The heavy seas in which these boats live, when under good management, is almost incredible : and the pace at which they sail, in tolerably smooth water, is equally so. In a stiff breeze they have been faithfully timed to sail *sixteen* knots an hour : a rate unequalled by any sailing boat in the world, with the exception only of the "Flying Proa" of the Ladrone Islands. .

In the management of Yarmouth yawls, it is necessary to guard against a heavy sea

striking them a broadside; the stem of the boat is always to be put forward to meet heavy seas. And in turning, when the waves run high, the crew watch for a smooth space or lull between the waves; and then turn as quickly as possible; sometimes with two or three long oars at the bow, with others to back at the stern: and the boat is round and on her way again before danger can reach her.

These boats usually belong to companies or crews of local boatmen or salvors; and though their mode of life is a perilous and precarious one, they sometimes earn a great deal of money. The author of "The Sailing Boat" says, "These brave fellows are a hardy, fearless race, and venture to sea in the most perilous gales to ships in distress: hundreds of lives have been saved by their daring exertions.

"Such men are an honour to their country, and more credit is due to them than to the crews of life-boats; the latter being supposed to be safe, even if the boat should upset; but if the beachman's yawl upsets, she sinks to the bottom."

THE COBLE.

THIS is a North Country boat of peculiar form : it is used for both purposes of rowing and sailing.

They have a very high and graceful bow, but a low ugly stern, and a rudder reaching down below the keel to the extent of two feet or more: the object of the deep rudder being, that in a heavy sea, when the stern is lifted high out of the water, the rudder has such deep hold, that the boat may, notwithstanding, be steered and guided with precision.

The coble oars are also peculiar, consisting of two or three separate parts, ringed and bolted together, and forming a flat-shaped loom with a powerful blade: the flat loom rests on the gunwale, and being provided with an iron ring firmly attached to it; the rower merely loops the ring over the single-iron thowl, and the oar is then ready for use. Of course its shape and position precludes the possibility of *feathering*: but they have the advantage of being capable of being turned either to stem or stern on going alongside, without the necessity of ever unship-

ping: and there is no danger of losing the oar, because it is securely looped to the iron thowl.

On going into shallow water, or approaching the beach, for the purpose of landing the crew, it is always the practice to unship the rudder and back the coble in stern first, as the end drawing far the lightest draught of water. It is also very usual to row these boats stern first in smooth water: but when sailed, they are always put bow foremost. And for this purpose, as a sea-going sailing boat, the coble is unequalled by any other kind of boat, with the exception of the, Yarmouth yawls. The fine, lofty, but knife-like bow of the coble, enables it to buffet, fearlessly, heavy waves, and sail in safety under skilful management in very bad weather. The North Country boatmen manage these boats with remarkable skill; and though they frequently encounter strong gales and heavy seas, they seldom come to grief.

Off Flamboro' Head on the coast of Yorkshire, no other description of open boat (except life-boats) is considered safe to put to sea in, during rough weather; so exposed and dangerous is the coast at that point.

The coble is usually sailed under a lug-sail

and fore-sail : but the mast is placed so as to rake aft very much. They sail on either tack without the sail being lowered, the yard remaining on the same side of the mast as that from which it is hoisted. Under this rig the sail is all inboard : and in bad weather the sea they go through is astonishing ; and they sail so fast that, when scudding before a gale, or running free, it is a very rare occurrence for a breaker to overtake them, or curl over the stern or the quarter, as it does in boats of another form.

In light winds the coble boatman sometimes run out a bowsprit, and set a jib : the coble bowsprit, however, does not stand out from the bows in a horizontal line as in river boats, but pointing upwards, like the jib-boom of a ship ; so that it acts as a lifting, as well as a powerful drawing sail. If the bowsprit of the coble were run out horizontally, as in river boats, it would drive the bows of the coble under the waves, and be carried away in the heavy seas to which these boats are exposed by the native boatmen on the north-east coast.

It is stated in "The Sailing Boat" that, "from time immemorial, the coble has been

renowned for superior qualities as a safe sea-boat, when under experienced management; but in unskilful hands it is, of all boats, the most liable to accident.

“The safety of the coble under sail depends almost entirely on the adjustment of the main-sheet: in a strong wind it is never made fast, but has frequently to be eased and humoured to the waves for safe management of the boat.”

The coble is exclusively a sea-going boat; its form is considered perfection for very rough water and strong winds; but ill-adapted for rivers, lakes, shallows, and inland navigation, because of its high-flaring bows and deep-suspended rudder.

MANAGEMENT OF OPEN BOATS IN HEAVY SEAS.

(UNDER OARS.)

IN a heavy sea, the longer the form of the boat, the safer it is. Short boats of any form are dangerous in heavy seas by reason of their liability to be tossed end over end: and, although they have high sides and are light and buoyant, the danger is great and the speed to be obtained

is very little : in fact, the action of wind or waves upon a very small short boat, generally gets the advantage of the rowers, and exposes them to danger.

Long-boats of a narrow form, but with flat floor, high flaring bows, moderately high stern, and rather low sides, are the safest kind of boat to manage under oars in heavy seas.

The more heavily a boat is laden, the greater will be the danger in a heavy or broken sea.

The great object to be avoided in the management of boats in heavy seas is, their inclination to *broach-to* : this may arise either when going head to wind or in the contrary direction ; and the danger increases with a sluggish boat. When the boat has no way on her, she immediately *broaches-to* : that is, turns round longitudinally into the trough of the sea, her broadside being exposed to the curl of the wave : and in such a position, in a heavy sea, it is almost impossible to prevent the water breaking over into the boat on the side next the wave ; and, unless the boat can be turned round immediately, the danger is imminent.

If the boat can be kept stem on : that is, its

bow towards the crest of the waves, the danger may be avoided ; and such is always the safest position in which you can place a boat in a heavy sea ; but remember, that unless you keep *way on her*, that is, keep the boat going, you have very little control over it.

The inclination of the boat to gripe, and *broach-to*, arises from the action of the waves upon the stem or stern : when the boat is tossed up and down in heavy seas, the bows are alternately deep in the water whilst the stern is lifted out of it, and *vice versa*. The *wind* then acts on the end exposed, and the *water* on the end that is deepest beneath it : a rudder in such case is nearly useless, and the oarsmen find a difficulty, with their united efforts, in keeping the boat in a straight course and prevent her broaching-to.

Another very important consideration to be attended to in the management of open boats in heavy seas is, to remove every atom of ballast out of the extreme ends of bow and stern ; and let it all be well secured from rolling or slipping ; and spread evenly over the floor of the boat amidships and abaft. If a small boat, there will probably be no ballast ; or it may be

considered advisable to throw a greater part of it over board in order to increase the buoyancy of the boat. At all events, let there be no ballast in the bows or stern ; and let none of the crew sit in the extreme ends of the boat. The aim should be to keep the ends as light and buoyant as possible, in order that they may rise to every wave or depression, and so prevent the water getting into the boat.

In moderate weather the best trim for the boat, whether under oars or sail, is deepest by the stern ; because it is then less likely to be turned or broached-to by the sea : but when scudding or rowing before a very heavy sea, it becomes a matter of discretion or question as to whether or no the stern is sufficiently buoyant to prevent the waves from breaking or running over it, and so swamping the boat.

Experienced boatmen always endeavour to “dodge” the heaviest breakers : and this can only be done by maintaining a complete control over the boat. There are two ways of dodging heavy waves ; one by slacking the speed of the boat and allowing the bows to rise steadily to the crest of the wave : this is called “taking it kindly.” The other mode of dodging is more

desperate ; it occurs when rowing across a heavy sea, with the wind a-beam, or on the quarter : the man at the stern on seeing a heavy wave approaching, which if allowed to strike the boat abroadside would swamp her, directs the boat's head to be turned to the wave, and so dodges it ; and often saves the boat from being filled, or the water from coming in over the bow.

When the rowers find a difficulty in keeping sufficient way on the boat so as to prevent its being driven back, or losing way, through the force of the wind or waves, the more speed that can be given to the boat the better and safer for those on board. The danger is always considerable, unless good way can be kept on the boat : because, in default, she is almost certain to broach-to.

When the rudder is rendered useless by reason of the stern of the boat being lifted out of the water with every wave, an oar should be used for steering : it should be placed either over the stern or on one of the quarters : the latter is the better plan, when rowing with the wind and sea abaft.

One of the modes used on the Norfolk coast for preventing a boat broaching-to, when being

rowed ashore, bow foremost, through heavy broken sea, is that of towing a *drogue* (see page 73) astern : the object of which is, to keep the boat's stern steady and in a straight course, and so prevent the danger of broaching-to.

In the absence of a *drogue*, a small bag of shingle, a large stone, or a bit of iron will answer the purpose in shallow water ; though not so well as a *drogue*.

If the boat has a heavy or broad stern, it should always be turned round, bow to seaward on beaching through a heavy or broken sea, and be backed in stern foremost. Meanwhile, one of the crew should sit facing to seaward, and give warning of the approach of heavy breakers ; so that the crew may, when desirable, reverse the propelling power, and pull a-head a few strokes in order to meet the breakers, and allow them to pass the boat.

Bear in mind, as the one guiding star in the management of open boats in heavy seas and broken water, that the boat must be kept *end on*, that is, either stem or stern facing the crest of the waves : whenever the broadside is presented or exposed to the waves, there is imminent danger.

The instructions above given apply chiefly to the management of boats on such shores as are flat and shallow: and on many parts of our coast this flatness extends several miles out to seaward. It is as well to remind the reader, that in all cases of rowing ashore in open boats, through heavy broken surfs, there is great danger: and it is safer to remain out at sea clear of the broken water, than incur the risk of attempting to row through any great extent of breakers. Many hundreds of lives have been lost in this manner, through the crews of wrecked vessels recklessly attempting to reach the shore during the fury of a gale.

On a flat coast the broken water is heaviest where the waves break, in about three or four fathoms of water; consequently, that is the most dangerous line of the coast: farther to seaward in deeper water there is, comparatively, little danger; and, after getting through the heaviest breakers, as the boat approaches the beach and gets into *one* fathom and less of water, the danger diminishes as the water shallows.

But, on the other hand, where the beach is steep, the boat should not be backed in stern

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foremost, but rowed in, bow first, at full speed : and on reaching the beach, the bow should be turned half round towards the surf ; and, on the crew jumping out, the boat will be thrown upon her broadside on the beach, and should then be hauled up quickly out of the reach of the sea.

When persons are shipwrecked within a few miles of the shore ; or, being at sea, a gale overtakes them and a heavy sea rises, with breakers between the land and the deep water, it is natural enough that they should look towards the shore with a longing desire to gain it as speedily as possible : but they are apt to forget, as they gaze across the short space which lies between them, that broken water always looks less dangerous from the sea-view than from the land : and, on venturing through it, they find to their dismay, that it would have been safer and more prudent to have remained out at sea beyond the perils of the breakers. If they would do so, it would sometimes be found, that by rowing along the coast a few miles, they could fetch some bay or safe landing place : or it may be, if a life-boat were near at hand, it would be sent out to them ; or at all events some larger and safer craft would be sent

to their assistance : or, if a ship be within sight, though far out at sea, they had better pull away for it than hasten to the certain destruction which awaits them on forcing a small or heavily laden boat through broken water.

MANAGEMENT OF OPEN BOATS IN HEAVY SEAS.

(UNDER SAIL.)

THE management of boats under sail, in heavy seas, is an art requiring considerable practice and experience, with a good nerve and good judgment. With these combined in the man at the helm, a boat's crew is comparatively safe : but lacking one or other of those qualities, considerable risk is incurred.

Attention should first be directed to the sails ; and no more canvas set than is necessary to keep good way on the boat. All the sail should be *inboard* ; no jib can be set ; and to save the bowsprit from being carried away, it should be runned inboard. The boat, if cutter or sloop rigged, will be best managed under close-reefed main-sail, and reefed fore-sail : if a two or three masted lugger, the main-sail should be lowered, and the boat sailed under fore-sail and mizzen.

If a single-masted lugger, a close-reefed main-sail will be the safest and only sail necessary.

Be sure that the main-sheet is not, *for a moment*, made fast; but always clear and ready to be eased off on the instant of approaching danger. See that the ballast is all safely secured, and that nothing can shift or roll over in the boat, though she pitch and roll ever so heavily. Remove every atom of ballast out of the bows: and if there is any in the extreme end of the stern, take it out and place it amidships.

Every soul in the boat should sit on the floor, trimming the boat fairly with their individual weights. And when necessary to attend to the sheets, in response to the orders of the man at the helm, or to perform any other duties aboard the boat, do them on your knees, or in any other crouching attitude, rather than standing.

The author of "The Sailing Boat" gives the following advice upon this subject:—"Let no one give an order but the man at the helm, who must bawl out so that his voice may not be lost in the wind: let his order be instantly obeyed. In his position he can see exactly what the boat will bear, and when she can bear it no longer: let the crew cringe down as low in the bottom of

the boat as possible ; let every rope lie in coils, clear and free from twists and hangings : let every movement be performed without standing up ; but rather by crawling on the knees, or in a flatter posture if possible."

There is not near so much danger in sailing close to the wind in a heavy sea, as there is in scudding or running before it : therefore, if you can lay your course *to the wind*, though a longer or more round about one, it will be more judicious than running the risk of scudding over a short one.

In sailing a boat in a heavy sea, the sails should not be set quite so flat, nor the boat sailed so near the wind as in smooth water. But care must be taken to keep the sails full : danger arises the moment the boat " has no way on her : " but the faster she goes, the more readily she obeys the helm.

When the boat obeys her helm, she may be said to be under good command. The man at the helm must be very watchful, and ease the little boat to the crest of the heaviest waves : this is done by luffing a very little and so presenting the stem only to the wave. As this critical, but exquisite feat of seamanship is more

clearly explained in "The Sailing Boat" than in any other work we ever met with, we cannot do better than quote the explanation given in that work.

The author says (pp. 179-180),—"In luffing to the heaviest of these waves, the least motion of the tiller will generally suffice. Be careful not to allow the boat to lose all way, or she will not answer to her helm: take advantage of every smooth sea, which usually follows three bouncing waves, to get good way on: keep her full and keep her at it, and only ease on the approach of a heavy wave likely to drive the bows under; in which case luff as it were into the very crest of the wave, which will stop the boat's progress for a second or more; and such must be regained, by bearing up instantly but slightly, to get the sails full again, that the boat may not roll over into the trough of the seas. Be not frightened at the boat's rising and falling with the waves; so long as she answers to her helm, if she can be kept from broaching-to, there is nothing to fear; on that hangs all the danger.

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"If the sea increases so much that it is impossible to keep the waves from rolling into

the boat, it will no longer be judicious to attempt beating to windward. Avoid putting the boat *about*, unless it can be done in smoother water : the most perilous time for open boats in a heavy sea is, when in stays. It will, therefore, be better to bear up ; and if a port can be reached with the wind abeam, such a course will be better than running directly before the wind. If it be then found that the boat has too much sail, lower the peak according to your discretion. If in running before the wind the sea travels faster than the boat, and threatens to run over the stern, shake a reef or two out of the main-sail, and run her as fast as possible ; but not so as to bury the bows of the boat under water : get into smooth water quickly, to get out of danger."

When scudding in a heavy sea, the man at the helm must be very cautious lest the sail should suddenly or unexpectedly gybe ; such a mishap would be certain to upset the boat, unless the main-sheet were let go at the very instant.

The rudder of a sea-going boat should always be hung or secured to the boat in such a manner that it cannot be unshipped by a heavy wave striking it. Many boats and vessels have been

lost, entirely through the rudder being carried away or unshipped by a heavy sea.

When, by reason of a contrary wind or heavy broken water intervening between you and the land, you deem it imprudent and dangerous to attempt forcing your boat in so heavy a sea, you may often, with good sea-room, ride out the heaviest gale by keeping well off the shore, and lashing together two or three of the largest and longest spars you have ; and then, after making a warp well fast round the *middle* of the spars, cast them overboard ; and so ride the boat by them at the bow, as a sort of floating anchor. It is astonishing how this will steady a boat and keep the force of the waves off when riding out a gale in a heavy sea ; and this, whether you are laying-to under a small sail or without any sail.

In absence of a few spars, a large oar, or a yard with a loosened sail, and with or without a weight suspended from the clue-sail, will answer the same purpose, and break the force of the sea, ahead of the boat, considerably.

DROGUES.

A DROGUE is a collapsible canvas bag of a conical form. The usual size when open is about two feet in diameter at the mouth, tapering to a point at the bottom, and about four and a half feet in length. For small boats they are made proportionably smaller.

The drogue is used for the purpose of checking the speed of a boat when driving in towards the shore, and for steadying its course, and keeping the boat's head or stern, as the case may be, in direct line across the crest of the waves, and so materially assisting in preventing the boat from broaching-to in a heavy sea.

The drogue collapses like an umbrella. When the services of the drogue are required it is tossed overboard and towed through the water with its mouth open, the towing-rope being made fast to the bridle attached to the rim or lips of the drogue. When drawn through the water in this manner, the drogue expands and fills with water, thereby checking the progress of the boat.

When the services of the drogue can be

dispensed with, and it becomes necessary to haul it into the boat, the towing-rope is slackened, and the drogue is hauled in by the tripping-line, which is made fast to the apex, or pointed end of the drogue: the tripping-line is a much smaller rope than the other. Directly the boatman pulls on the tripping-line, the drogue turns round and instantly collapses, so that it may be drawn on board with ease.

Drogues are much used by the native boatmen at Yarmouth, and various other parts of the coast. They are considered by the Norfolk coast boatmen to be of essential service in assisting to keep the boat *end-on* in heavy seas. They are used in rowing as well as sailing boats: and life-boats are, in some parts, provided with them.

CROSSING THE BAR.

THE entrance to many of our harbours and rivers is over a shallow bank of sand or shingle called a "bar;" and whenever the wind blows from the seaward to the bar, there is always a heavy broken sea running over the bar, rendering it difficult and dangerous to cross in

small or open boats ; and if the boat *broaches-to* when among the breakers, she generally fills.

The success or safety of crossing the bar depends mainly on the skill, steadiness, and promptitude of the crew in the management and guidance of the boat ; steering it with the rudder if in force, but relying chiefly on the oars.

A boat will not rise over the surf or breakers as it does over *unbroken waves* ; breakers pursue the boat, and curl over into it, unless a craft with a high stern.

It is safest to cross a bar *stem-on*, particularly when coming out of the harbour ; and it is often advisable to back in stern first when going into harbour, so as to keep the bow towards the crest of the breakers ; for it is always a maxim among native boatmen, in the management of open boats in heavy surfs, that the narrower and sharper the surface presented to the surf or breaker, the less will be the power and action of the wave upon it ; and consequently the easier and safer the boat goes through it.

On entering a bar-harbour it sometimes happens that necessity, or some other cause,

compels the crew to cross the bar by going before the wind stern-on ; in which case the stern is much exposed to the breakers, particularly if a low one.

The force of the waves, in such case, frequently impels the boat beyond the control of her crew ; and the tendency to gripe and broach-to is much increased by the stern being lifted considerably higher than the bow, thereby depressing the bow deeply under water.

It is sometimes found desirable, when crossing the bar for the purpose of going into harbour, on entering the broken water stern foremost, to pull a-head a few strokes and meet the heaviest of the breakers, rather than allow them to follow up the boat ; and then, immediately afterwards, to back astern as fast as possible. With small boats this is as safe a mode of entering a bar harbour as any that can be suggested.

AS TO THE MANAGEMENT OF SAILING BOATS IN SQUALLS.

A HEAVY squall may generally be seen at a long distance before it approaches the boat when on a wide or open space of water, the

force of the wind bringing up a distinctly visible white sheet of foam along with it. When in a small open boat, and indications such as these appear, the most prudent course to take is, if a very threatening squall, to brail up the sail, or take out the spreet (if a sprit-sail rigged boat), and lower the peak and fore-sail, or trice up the main-tack if cutter-rigged. By taking one of such precautions, as promptly as possible, you may probably save your boat from being capsized, or your mast from being carried away.

If the approaching squall appears to be only a light one, the precaution of shortening sail will not be necessary ; but, under skilful management, the boat may be safely conducted through it. The helmsman, however, must be particularly careful that the main-sheet is all clear and free, in order that it may be let go in an instant if necessity or danger requires. If an experinced boat-sailor he will allow the boat to just feel the squall, and strike the sails, and then he will instantly luff the boat up into the eye of the wind ; but only for an instant : as soon as the sails quiver, he will bear away again immediately, so as not

to allow the boat to *lose way*; for a squall presses with double force on the sails of a boat with no way upon her, to what it does on one moving rapidly through the water. And besides, too, a boat obeys her helm so much better when it has good way upon her than when moving slowly through the water, or when suddenly thrown on her side by a squall.

A light squall may be easily distinguished from a heavy one: the light one flits across the water like a dark cloud, and with very little of a white crest; but a heavy, or white squall, which is the boat-sailors' dread, comes with a fierce, white, foamy surface, across the blue waters of the sea.

If your sails are reefed, and your boat be a safe and powerful one, and you have confidence in your skill as a helmsman, you need not fear a summer squall, though a heavy one, when prepared for it; you may conduct your boat through it in safety by what is termed "sailing her narrow," that is, *very* close to the wind, the fore-leech of the sails just quivering from being in the eye of the wind, whilst the aft part of the sail is all that presses upon the boat.

I have sailed open boats in this manner under very trying circumstances of heavy and dangerous squalls; but I warn all young sailors of the risk attending it, and recommend them to adopt the plan of shortening sail when heavy squalls are expected.

Lug-sail boats are managed somewhat differently in squalls. It is usual, in heavy squalls, to let go the halliards and lower the lug-sail until the squall has passed over.

Bear in mind that putting the helm *down* is the only safe plan when a squall strikes the boat whilst you are running free. Putting the helm down is to push it over on the same side as that of the main-sail, or rather that side which is borne down by the pressure; putting the *helm up* is to draw it *from* the sail or leaning side. If you put your helm *up*, on a heavy squall striking the sails, it is ten to one but the boat will be capsized.

The Laws of Sailing Matches.

YACHTS AND BOATS.

1. *Cutters* shall be allowed the use of four sails only ; viz., main-sail, fore-sail, jib, and gaff-top-sail. *Yawls*, the same sails as cutters, with the addition of a mizzen. *Sloops*, main-sail, fore-sail, and gaff-top-sail. *Schooners*, main-sail, fore-sail, fore-stay-sail, jib, main-gaff-top-sail, and fore-top-gallant-sail. *Lateens*, main-sail, fore-sail, and mizzen. *Luggers*, three lugs, jib, and top-sails. *Skiffs* and *centre-board* boats to use two sails only.

2. Three vessels to start or no race.

3. All entries shall be made on or before six o'clock, P.M., on the day previous to the race ; and each vessel to be entered with her distinguishing colour to be carried throughout the race at her mast-head.

4. No trimming or shifting of ballast, and no heaving or throwing ballast overboard shall be allowed during the race.

5. Lots shall be drawn, after the entries are closed, for choice of stations.

6. No jibs or fore-sails to be boomed out : and no sweeps, boat-hooks, or setting-booms to be used during the race : no other means of sounding the depth to be allowed than the lead-line.

7. Any vessel wilfully fouling another in the same match, to forfeit all claim to the prize.

8. Vessels on the port tack shall give way to those on the starboard tack. Vessels sailing free to give way to those on a wind.

9. Any vessel bearing away or altering her course to leeward, thereby compelling another to go out of her course, shall forfeit all claim to the prize.

10. If two or more vessels (by the wind) are approaching the shore, or any other obstruction ; and are so close to each other, that the leewardmost cannot tack clear of the weathermost, and by standing farther on would risk her running foul or ashore ; the weathermost vessel, on being requested to put about, is immediately to do so ; but the leewardmost must also tack at the same time as the one she hails.

11. No anchoring allowed during the race,

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except to prevent accident ; in which case the anchor shall be weighed and taken aboard again.

12. Each vessel to go fairly round the mark buoys, without touching the same ; the vessel nearest thereto to be considered the headmost ; and should any other vessel in the race compel the headmost vessel to touch such mark buoys, the vessel so compelling her, to forfeit all claim to the prize, and the headmost vessel to be held harmless for such contact.

13. All protests to be delivered in writing, to the secretary, judge, sailing committee, or other person or persons appointed to receive the same, within two hours after the race.

14. No person shall be allowed to go aboard, or leave a vessel, during the race for any purpose whatever, except in case of getting aground ; when all who jump overboard must return again into the boat.

15. Any vessel failing to comply with any or either of the above laws, to forfeit all claim to the prize.

INSTRUCTIONS FOR RESCUING DROWNING
PERSONS.

It is impossible for any one to give reliable instructions upon so critical and perilous a performance as that of plunging into deep water to save the life of a drowning fellow-creature, unless enabled to do so from substantial experience. Indeed, any one who writes upon such a subject might incur the gravest responsibility through unintentionally recommending proceedings, which, if carried out, might sacrifice the lives of the brave, humane, and daring. Although a man may be ever so able a swimmer, still he may drown himself in his attempts to save others, unless he proceeds cautiously and with very much discretion.

Under these circumstances, the author of this little treatise is not disposed to incur the grave responsibility of offering to his readers any other than the well-tried experiences of those who have actually saved persons from drowning by swimming after, diving, and bringing them safely to land.

The following directions are, therefore, bor-

rowed from the "Life-Boat Journal:" they are written by Mr. Joseph H. Hodgson, of Sunderland, who is known in that neighbourhood as the "Stormy Petrel," and who is believed to be the most competent person in the kingdom, to give practical directions on the perilous art; he having, it is said, made it his study from boyhood, and saved more persons from drowning, by swimming to their aid, than any other person in the British Islands.

The following are Mr. Hodgson's directions for *saving drowning persons by swimming to their relief*:—

"1st. When you approach a person drowning in the water, assure him, with a loud and firm voice, that he is safe.

"2nd. Before jumping in to save him, divest yourself as far and as quickly as possible of all clothes; tear them off if necessary; but if there is not time, loose, at all events, the foot of your drawers if they are tied: as, if you do not do so, they fill with water and drag you.

"3rd. On swimming to a person in the sea, if he be struggling, do not seize him then, but keep off for a few seconds till he gets quiet; for it is sheer madness to take hold of a man when

he is struggling in the water, and, if you do, you run a great risk.

“4th. Then get close to him, and take fast hold of the hair of his head, turn him as quickly as possible on to his back, give him a sudden pull and this will cause him to float, then throw yourself on your back also and swim for the shore, both hands having hold of his hair, you on your back and he on his, and of course his back to your stomach. In this way you will get sooner and safer ashore than by any other means, and you can easily thus swim with two or three persons: the writer has often, as an experiment, done it with four, and gone with them forty or fifty yards in the sea. One great advantage of this method is, that it enables you to keep your head up, and also to hold the person’s head up you are trying to save. It is of primary importance that you take fast hold of the hair, and throw both the person and yourself on your backs. After many experiments, I find this vastly preferable to all other methods. You can in this manner float nearly as long as you please, or until a boat or other help can be obtained.

“5th. I believe there is no such thing as a

death-grasp, at least it must be unusual ; for I have seen many persons drowned, and have never witnessed it. As soon as a drowning man begins to get feeble and to lose his recollection, he gradually slackens his hold until he quits it altogether. No apprehension need, therefore, be felt on that head when attempting to rescue a drowning person.

“ 6th. After a person has sunk to the bottom, if the water be smooth, the exact position where the body lies may be known by the air bubbles, which will occasionally rise to the surface, allowance being of course made for the motion of the water, if in a tideway or stream, which will have carried the bubbles out of a perpendicular course in rising to the surface. A body may be often regained from the bottom before too late for recovery, by diving for it in the direction indicated by these bubbles.

“ 7th. On rescuing a person by diving to the bottom, the hair of the head should be seized by one hand only, and the other used in conjunction with the feet in raising yourself and the drowning person to the surface.

“ 8th. If in the sea, it may sometimes be a great error to try to get to land. If there be a

strong "out-setting" tide, and you are swimming either by yourself, or having hold of a person who cannot swim, then get on to your back and float till help comes. Many a man exhausts himself by stemming the billows for the shore on a back-going tide, and sinks in the effort, when, if he had floated, a boat or other aid might have been obtained.

"9th. These instructions apply alike to all circumstances, whether the roughest sea or smooth water."

DIRECTIONS FOR RESTORING TO LIFE PERSONS APPARENTLY DROWNED.

THE moment the body is brought ashore, commence at once in the open air to restore animation, and if there is no house or building close at hand, the patient should be treated on the spot. Meanwhile send for blankets, flannels, and dry clothing, and also for medical aid.

The most important considerations are the restoration of breathing, and the prevention of any further diminution of warmth in the body ; *as soon as the breathing is restored, warmth*

of the body and circulation of the blood should be promoted as much as possible.

Success depends entirely on the immediate, energetic, and persevering efforts to restore breathing and prevent the further diminution of warmth in the body. These efforts should be persevered in for several hours, or until the life of the patient is pronounced by some experienced medical practitioner to be extinct.

The efforts to promote and increase the warmth of the body and the circulation of the blood must not be commenced until natural breathing has been restored. But efforts should be made in the very first instance to restore breathing by placing the patient on his stomach, with his face downwards, his forehead resting on one of his arms. In this position the tongue will drop forwards, and leave a free entrance into the windpipe, and choking fluids will escape at the mouth; this operation should be assisted by cleansing and wiping the mouth.

Wipe the face, neck, and chest dry as soon as possible, then strip and wipe the whole body, hands, and feet, and cover with warm, dry blankets; and if those are not at hand, borrow warm coats or clothing of the bystanders.

Meanwhile attend particularly to the efforts to restore breathing. Turn the patient on his side, rub his chest and face warm, occasionally dashing cold water upon it. If snuff, harts-horn, or smelling salts are at hand, apply one or other of them to the nostrils, and excite and tickle the throat with a feather.

If no signs of breathing appear after the above means have been tried, then instantly turn and replace the patient with his face downwards, the chest being a little raised, and supported on a folded coat or cushion ; then *gently* turn the patient on his side and rather more, and *briskly* turn him again on to his chest and face ; repeat this proceeding with care and steady perseverance at the rate of fifteen times in a minute, until natural breathing is restored, turning the patient sometimes to the right, and sometimes to the left.

When the patient is on his chest, the weight of the body forces out the air ; and when turned on his side, the pressure is removed, and the air enters the chest.

At every turn of the body face downwards, press your hand firmly and briskly on the patient's back between and below the shoulder

blades on each side ; but remove the pressure instantly before you turn the body on its side again.

These measures must be deliberately and perseveringly adopted until *satisfactory* breathing returns : they should be continued during *slight* breathing. But as soon as a natural and satisfactory breathing has returned, rub the limbs upwards, grasping and pressing them firmly outside the dry clothing or under the blankets : rub energetically, and with warm hands. It is by this means that the blood is propelled along the veins towards the heart.

Still further to promote the warmth of the body after the satisfactory breathing has returned, hot flannels, bottles, or bladders of hot water, heated bricks, tiles, or stones should be applied to the stomach, the arm-pits, between the thighs, and to the soles of the feet.

If the patient has been taken indoors, let there be a free admittance of air to the room.

Bear in mind that the efforts to prevent any further diminution of warmth to the body, which are among the first means to be resorted to, must be made with caution ; for if artificial warmth of the body, and rapid circulation of

the blood be induced before the breathing has been restored, the life of the patient will be endangered.

As soon as the patient is restored to life, give him a tea-spoonful of warm water : and when the power of swallowing has returned, give him several tea-spoonfuls of wine, warm brandy-and-water, or coffee. The patient should then be kept in bed, and encouraged to sleep.

CAUTIONS.

1. It is an erroneous impression that persons are beyond recovery when breathing and life do not soon appear. Patients have often been successfully treated when apparently quite lifeless, by persevering for many hours in the treatment we have recommended.

2. Never under any circumstances hold the body up by the feet.

3. Never roll the body on casks.

4. Never inject tobacco smoke or infusion of tobacco into the nostrils or mouth.

5. Do *not* rub the body with salt or spirits.

6. Do *not* put the patient in a warm bath.

7. Be careful to avoid all rough usage, and do *not* turn the patient on his back.

8. Do *not* allow persons to crowd round the body so as to prevent the air playing freely about the patient.

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